

Enhanced Position Location Reporting System: An Ineffective Radio On Today's Modern Battlefield

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ENHANCED POSITION LOCATION REPORTING SYSTEM: AN INEFFECTIVE
RADIO ON TODAY'S MODERN BATTLEFIELD

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The current and future battlefield has become heavily reliant on tactical data communications equipment to ensure timely and accurate dissemination of information on the battlefield. Additionally, new tactical equipment such as the expeditionary fighting vehicle (EFV) has greatly enhanced the speed and distances units can travel on the modern battlefield. Satellite communication has exponentially increased the range and flexibility of communications on the modern battlefield, but only at the Marine Division and above via ground mobile force (GMF) or in limited quantities via tactical satellite communications with the AN/PSC-5 and the AN/PRC-117F. The principal communications equipment used for passing tactical data communications at the infantry battalion and below is the Enhanced Position Location Reporting System (EPLRS). The introduction of newer computers capable of handling higher data rates and the speed and ability to project combat power forward, as was shown in Operations Enduring Freedom (OEF) and Iraqi Freedom-1 (OIF-1), has changed the requirement of tactical data communications on the modern battlefield. Due to a lack of mobility, limited bandwidth and connectivity problems, the EPLRS radio system is not an effective tactical data communications option, and must be replaced by a more capable system.

LACK OF MOBILITY

During the first phases of Operation Iraqi Freedom, the 1st Marine Expeditionary Force moved a substantial distance before having to conduct an operational pause for sustainment operations before resuming the offensive. During this time, EPLRS went widely unused due to its lack of over-the-horizon capability which uses an ultra high frequency (UHF) line-of-sight system. When speed and tempo are high, this restraint makes EPLRS operations almost impossible during offensive operations. On the Center for Army Lessons Learned (CALL) internet website, a Marine who served in Iraq submitted this after action comment: "In this fast paced war, if a communications system was not functioning quickly, alternative methods were employed. This was a specific problem of the EPLRS radio (which relies on Line of Site (LOS)). With units constantly moving, LOS was not possible."¹

Moreover, EPLRS' lack of range forces the communications officer to set up relay systems throughout the battlefield in order to ensure proper connectivity. These relay systems are normally placed on the highest mountain or hilltop available. While this may be the most advantageous option from a communications standpoint, this does not take into account force protection, security issues, and targeting of those hilltops by a thinking enemy.

Furthermore, as distributed operations become more prevalent throughout the Marine Corps and units become more widely disbursed, the United States Marine Corps must plan for a reliable, redundant, and robust data communication option at the infantry battalion and below. EPLRS does not meet the required data communications needs at the infantry battalion. The EFV has the capability to travel 25 knots per hour in the water and 45 miles per hour on land.² As these vehicles conduct rapid force projection forward, the data communications infrastructure cannot keep up.

Finally, EPLRS cannot keep up with rapid force projection forward due to its system constraints. Also, the current configuration is not man portable due to the size and weight of the radio system, so it is not the data communications option in densely forested terrain, jungle terrain or an urban area.

BANDWIDTH LIMITATIONS

Today's emerging technology is making high data communications exchange a reality in the civilian community. This high data rate transmission medium gives the average consumer the ability to transmit and receive massive amounts of data in a very short period of time. This high data rate transfer equates to time saved at home or money saved at a business. In the military, high data rate transfer equates to

shared situational awareness and increased operational tempo. Increased situational awareness and tempo will have a substantial impact on the enemy and can be the difference between victory and defeat on the battlefield. This high data rate transfer is available at the division and MEF level only through its organic GMF satellite communications terminals. As the echelons of command decrease to the infantry battalion and company, the only method of data transfer becomes EPLRS. At this level, EPLRS' substantial decrease in data communications transmissions equates to lower shared situational awareness and a slower tempo of operations due to a lack of information exchange. As operational requirements for increased data exchange continue to grow, the EPLRS radio is not able to handle this increase.

CONNECTIVITY PROBLEMS

As mentioned earlier, the EPLRS radio system is a ground-based line-of-sight radio. With an estimated seven-foot antenna height on an average vehicle, this design limits the radio to approximately seven miles on flat terrain, not taking into account any micro-terrain that may hinder communications. Movement during offensive operations is not the only scenario in which the EPLRS radio system is lacking. Combat service support units, who regularly travel great distances to resupply forward-

based units, also experience connectivity issues. A combat service support Marine who was interviewed after serving in Iraq stated: "The EPLRS network, in support of the lower tactical internet and FBCB2 system, is not designed to provide the adequate range extension required for CSS units to maintain continuous situational awareness when executing operations throughout a non-linear battlefield."³

A MORE CAPABLE SYSTEM

As has been discussed throughout, the EPLRS radio system is proving itself to be unreliable as a tactical level data communications terminal. The Marine Corps has used a radio system with similar capabilities throughout Operation Iraqi Freedom, but the system is not a program of record within the Marine Corps. This radio system is the U.S. Army's Blue Force Tracker (BFT). The most striking difference between the two radio systems is that while EPLRS is a ground-based line-of-sight radio system, the Army's BFT is a satellite communications terminal and is not limited to line-of-sight operations. This characteristic has proven essential on today's non-linear, dispersed battlefield. "The only consistently reliable means of communication was "SATCOM."...The only systems consistently praised by the Marines were the Blue Force Tracker (SATCOM-

though unsecure) and Iridium Phones (SATCOM). These systems provided reliable communications at all times. In many instances these systems were the sole means of communication."⁴

In addition to the obvious advantage of beyond line-of-sight capability, the overall system was praised for its responsiveness and download capabilities. Ted Cormaney, an analyst who interviewed numerous units within the Iraq theatre of operations concluded: "The Blue Force Tracker proved very popular with Marines from both LAR and 2D Tank Battalion. The 5.1 MB download capability proved to be very useful. Real-time information transfer and satellite imagery was mission critical on several occasions. BFT was considered 'very responsive' due to instant messaging capability. Most of the commanders agreed that the pace of the battle required a device similar to Blue Force Tracker. Units were, at times, unable to maintain VHF over distance due to the inability to establish retransmission sites. Potential retrans sites would be forecasted to be located in unsecure areas. In the absence of communications, BFT provided units with responsive message traffic. Tanks and LAR used it in the absence of radios. It was, at times, the only means of communication for dispersed units. BFT was considered very reliable for providing friendly situation reports."⁵

Finally, not only is the BFT a more robust, reliable and capable system, the Marines who operated the BFT noted its ease

of use, and chose it over EPLRS, "Operator training for the BFT is simplistic and the system is very operator friendly. Additionally the BFT provides a larger throughput capability for free text or formatted messages to any BFT throughout the world via satellite connection and the 1st Marine Division Marines found this capability very useful to maintain PLI and data text messaging 'on the move' from the Division to RCT to Battalion Command Posts. For the 1st Marine Division, BFT was the overwhelming system of choice. Recommendation: That MCSC disestablish the MDACT program and establish a joint BFT program with the US Army that could support worldwide PLI for the Marine Corps from the MEU to the MEF." ⁶

CONCLUSION

Although EPLRS is currently the Marine Corps' choice for tactical data communications connectivity, the future battlefield is rapidly proving this radio system to be ineffective. The LOS restraint of this radio system is hampering maneuver units and their ability to project power forward while maintaining a reliable data communications capability. Additionally, its bandwidth limitations have not been able to keep up with the increased need for a bigger data communication "pipe" to accommodate emerging technology and enhanced tactical imagery that must be sent. A current option

available to the Marine Corps is the U.S. Army's Blue Force Tracker. This radio system possesses beyond line-of-sight capability that is essential in today's modern battlefield. Moreover, the EPLRS' inability to adapt to emerging technology limits information exchange, thus hampering shared situational awareness and reducing operational tempo.

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NOTES

1. Dienhart, Patricia, Captain USMC, Howard, Mike, Captain USMC, and Roos, Shannon, Captain USMC, "Field Report Marine Corps Systems Command Liaison Team," *Center for Army Lessons Learned*, <<https://call2.army.mil/focus/oif/asp/lessons/fieldreport.asp>> (22 November 2005), Satellite Communications.

2. "Expeditionary Fighting Vehicle," *DRPM AAA*, <<http://www.efv.usmc.mil/EFV/FAQ/default.asp#4>> (22 November 2005), Frequently Asked Questions.

3. "IIR 04-13: Chapter 4, Combat Service Support," *Center for Army Lessons Learned*, <<https://call2.army.mil/products/iir/asp/04-13/ch-4.asp>> (22 November 2005), CSS C3I.

4. Dienhart, Howard, and Roos, Satellite Communications.

5. Ted Cormaney, "Marine Corps Operation Iraqi Freedom Field Report: THE GOOD, THE BAD AND THE UGLY, A HILLINT analysis," *Center for Army Lessons Learned*, <<https://call2.army.mil/docs/aar/asp/hillint.asp>> (22 November 2005), Blue Force Tracker (BFT).

6. "Operation Iraqi Freedom - 1st Marine Division," *Center for Army Lessons Learned*, <<https://call2.army.mil/focus/oif/asp/lessons/lmardivoif.asp>> (22 November 2005), G-6.

BIBLIOGRAPHY

Cormaney, Ted. "Marine Corps Operation Iraqi Freedom Field Report: THE GOOD, THE BAD AND THE UGLY, A HILLINT analysis," *Center for Army Lessons Learned*, <<https://call2.army.mil/docs/aar/asp/hillint.asp>> (22 November 2005), Blue Force Tracker (BFT).

Dienhart, Patricia, Captain USMC, Howard, Mike, Captain USMC, and Roos, Shannon, Captain USMC, "Field Report Marine Corps Systems Command Liaison Team," *Center for Army Lessons Learned* <<https://call2.army.mil/focus/oif/asp/lessons/fieldreport.asp>> (22 November 2005), Satellite Communications.

"Expeditionary Fighting Vehicle," *DRPM AAA*, <<http://www.efv.usmc.mil/EFV/FAQ/default.asp#4>> (22 November 2005), Frequently Asked Questions.

"IIR 04-13: Chapter 4, Combat Service Support," *Center for Army Lessons Learned*, <<https://call2.army.mil/products/iir/asp/04-13/ch-4.asp>> (22 November 2005), CSS C3I.

"Operation Iraqi Freedom - 1st Marine Division," *Center for Army Lessons Learned*, <<https://call2.army.mil/focus/oif/asp/lessons/lmardivoif.asp>> (22 November 2005), G-6.